

File Number: 96-41D1
Filing Date: March 3, 2000
Express Mail Label No. EL488339843US

UNITED STATES PATENT APPLICATION

OF

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FOR

~~COMPOSITIONS AND METHODS FOR STIMULATING PANCREATIC ISLET CELL~~

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andt 8* ^{REGENERATION} \sim ZINS1 POLYPEPTIDE COMPOSITION
STIMULATING PANCREATIC ISLET GROWTH

PATENT APPLICATION

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2INS1 POLYPEPTIDE COMPOSITION
↑ STIMULATING PANCREATIC ISLET GROWTH

DESCRIPTION

5 Compositions and Methods for Stimulating Pancreatic Islet
Cell Regeneration

Ans P1

BACKGROUND OF THE INVENTION

10 β -cells are specialized cells that secrete insulin and are found in pancreatic islets. Insulin belongs to a group of protein/polypeptide hormones. Insulin increases the rate of synthesis of glycogen, fatty acids, and proteins and stimulates glycolysis and cell 15 proliferation. It also promotes the transport of glucose, and some other sugars, and amino acids into muscle and fat cells. Insulin levels are regulated to maintain glycemic homeostasis, and an important mechanism for regulating insulin production, and hence insulin levels, is β -cell 20 mass.

During the lifetime of an individual metabolic needs can change drastically, requiring dynamic changes in cells and tissues that regulate homeostasis. During pregnancy (Marynissen et al., *Diabetes* 36:883-891, 1987) 25 β -cell mass increases, as well as in response to obesity (Kloppel et al., *Surv. Synth. Pathol. Res.* 4:110-125, 1985). These increases in β -cell mass are attributed to an increased requirement for insulin to maintain normal glucose levels (Parsons et al., *Endocrinology* 130:1459-30 1466, 1992). It has also been shown that β -cell mass normally decreases post-partum, primarily by apoptosis (Scaglia et al., *Endocrinology* 136:5461-5468, 1995).

It is generally believed that increases in β -cell mass occurs in three ways: 1) an increase in cell 35 size and function; 2) increased proliferation of mature β -cells; and/or 3) increased recruitment and differentiation of β -cell progenitors. In diabetic mice, animals that